

(19) World Intellectual Property  
Organization  
International Bureau



(43) International Publication Date  
7 April 2005 (07.04.2005)

PCT

(10) International Publication Number  
WO 2005/031992 A1

(51) International Patent Classification<sup>7</sup>: H04B 1/036  
(21) International Application Number:  
PCT/KR2004/002476

(22) International Filing Date:  
24 September 2004 (24.09.2004)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
10-2003-0068390 1 October 2003 (01.10.2003) KR

(71) Applicant (for all designated States except US): UT-  
Starcom Korea Limited [KR/KR]; San 136-1, Ami-ri,  
Bubal-eub Icheon-si., Kyongki-do 467-701 (KR).

(72) Inventor; and

(73) Inventor/Applicant (for US only): LEE, Dong Gyu  
[KR/KR]; San 136-1, Ami-ri, Bubal-eub Icheon-si,  
Gyeonggi-do 467-860 (KR).

(74) Agent: AN, Kook Chan; Hannuri Bldg. 219 Naeja-dong,  
Chongno-gu., Seoul 110-053 (KR).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG,  
MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG, PH,  
PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN,  
TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

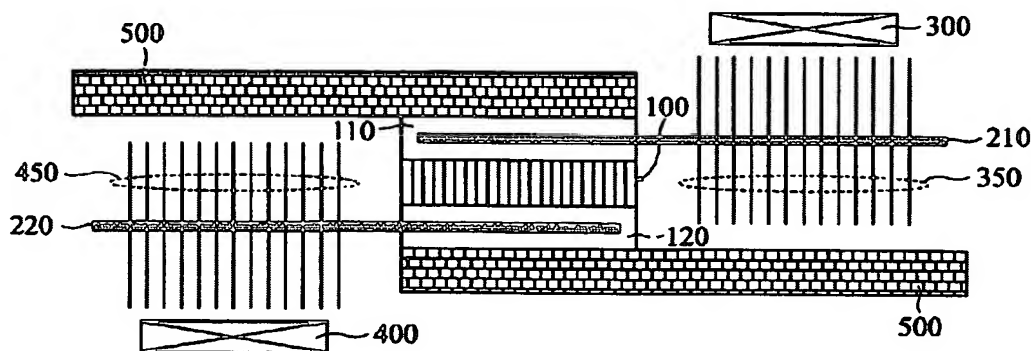
(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IT, LU, MC, NL, PL, PT, RO, SE, SI,  
SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,  
GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: COMPACT THERMAL EXCHANGE UNIT OF THERMO-ELECTRIC COOLING MODE USING HEAT PIPE



(57) Abstract: The present invention relates to a thermal exchange device using heat pipes to effectively discharge heat from inside of an open-air communication system. The present invention provides a plurality of heat pipes directly inserted between the plates of the thermo-electric cooling unit for accommodating a plurality of fins thereon. According to the structure suggested by the invention, since the heat pipes can be placed laterally with the thermo-electric cooling unit, the size of the overall communication system can be reduced with the same discharge capability.